ACID DEW POINT

From: James Nelson
To: Bret Kent
Date: 9/19/2003 11:21:20 AM
Subject: Fwd: Min operating load and acid dew point

This looks fine Bret. At least we can show where we are going. thanks

>>> Bret Kent 9/19/2003 8:26:47 AM >>>
James,

Here is a summary of what I was able to find on minimum operating load and acid dew point.

Acid dew point for our flue gas is between 180 and 190 deg F. Safe area to operate is between 210 and 220 deg F. For this evaluation I used 220 deg F.

Before the Outage Last Year (2/28/03 23:20:00)

Gas Outlet Temperature: 234 deg F (AVG of U1 1A and 1B SAH's)
U1 B casing Inlet Temp: 221 deg F
Unit Load: 184 MW

Post Outage (4/5/03 00:22:00)

Gas Outlet Temperature: 235 deg F (AVG of U1 1A and 1B SAH's)
U1 B casing Inlet Temp: 221 deg F
Unit Load: 178 MW

You can see that not a lot changed during the uprate work. Unit load dropped 6 MW but nothing significant.

Our Current Conditions (9/17/03 19:13:00)

At 67 deg F ambient and 950 MW load

Gas Outlet Temperature: 303 deg F (AVG of U1 1A and 1B SAH's)
U1 A casing Inlet Temp: 283 deg F
U1 B casing Inlet Temp: 312 deg F
U1 C casing Inlet Temp: 285 deg F

Expected Condition after SAH Upgrade

At 67 deg F ambient and 950 MW load

Gas Outlet Temperature: 272 deg F (AVG of U1 1A and 1B SAH's)

Ratio of Outlet Temperatures = 303/272 =1.114

So I would say the minimum operating load will need to be increased roughly 12%. From 300MW to 340-350MW.

Let me know if you would like to discuss further.

Bret

ACID DEW POINT

Before outage 2/28/03

OUTLET TEMP 234°F (AVG OF U1 1A & 1B SAH)
U1 CASING B INLET 221°F
UNIT LOAD 184 MW

POST OUTAGE 4/5/03

OUTLET TEMP 235°F
U1 CASING B INLET 221°F
UNIT LOAD 178 MW

CURRENT CONDITIONS

AT 67°F INLET AND 950MW
GAS OUTLET 303°F (AVG)

A CASING 283°F
B CASING 312°F
C CASING 285°F

EXPECTED CONDITIONS

GAS OUT LET 272°F @ 950 MW

$$\text{RATIO} = \frac{272}{303} = .898$$

$178 \cdot 1.114 = 198$ MW